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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,001	07/29/2003	Carrie Carter Coman	LUM-9390-1D	7729

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PATENT LAW GROUP LLP  
2635 NORTH FIRST STREET  
SUITE 223  
SAN JOSE, CA 95134

EXAMINER

MULPURI, SAVITRI

ART UNIT PAPER NUMBER

2812

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/631,001

Applicant(s)

COMAN ET AL.

Examiner

Savitri Mulpuri

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 6,8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/29/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This application is a divisional Application No. 09/245,503, filed 2/5/1999.

#### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 7/29/04 was considered by the examiner.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1- 5, 7, 11-13 are rejected under 35 U.S.C. 102(a) as being anticipated by Kish et al (US 5,583,561)

Kish et al teaches forming pn junction light emitting stature with upper and lower DBR shaving active layer in between on a growth substrata "127"; bonding a host substrate "127" (see fig. 8a); removing the growth substrate to expose the lower DBR; forming contact on lower DBR and on the exposed side of the host substrate (see fig. 8b and col. 6, lines 59-65). Kish particularly mentions the invention is practiced by using nitride-based semiconductor (see col. 7, lines 60-65). Kish further teaches first and

second bonding layers on either side of the bonding interface as intermediate layers.

Kish inherently teach the recited limitation in claim 4 of first bonding layer of metal from a group including silver, nickel, aluminum, gold, and cobalt, which can be interpreted as any material including recited elements (6b, and col.5, lines 33-43). Kish teaches host substrate is GaAs (see col4, lines 61). Kish also teaches etching the substrate by etching. It is well known to use silver as electrical contact material of high reflectivity.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 –10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kish et al in combination with Itoh et al (US 6,156,584)

Kish et al do not teach singulating the GaN based light emitting structure. Itoh et al teaches etching light emitting structure; and singulating the substrate (see 2 and related description). It would have been obvious to one of ordinary skill in the art to obtain individual light emitting structure by etching and singulating because such process does not result in any damage to the light emitting structure (see abstract).

Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kish et al in combination with Carey et al (US 6,276,996).

Kish et al do not teach forming DBR after removing the growth substrate; etching part of the DBR and to expose part of the light emitting structure and forming electrical

contact on the etched portion of the light emitting structure. Carey et al teaches forming lowed DBR on a first substrate; forming active layer on second substrate fusing first and second substrates to form active layer on lowed DBR; removing the second substrate; forming second DBR on a third substrate and forming DBR on active layer through bonding the first and third substrates and then etching part of the DBR and forming contact "326" on the exposed part of the active layer (see abstract and fig 3 D and related description). It would have been obvious to one of ordinary skill in the art to form DBR after removal of the growth substrate in the invention of Kish et al and then forming DBR on the exposed portion of the light emitting structure by bonding substrate with DBR because such process gives lased performance for desired wavelength as suggested by Carey et al. S

Claim 6, 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: Prior art neither teach nor suggest III-N based light emitting structure formed by bonding technique, wherein first electrical contact is electrically connected to the p-type GaN layer and second electrical contact is electrically connecting to n-type GaN layer and forming second electrical contact on a side of the host substrate opposite the first substrate, wherein the second bonding layer is deposited on the first substrate electrical contact.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art teaches forming light emitting structures with bonding methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 703.305.5184. The examiner can normally be reached on Mon-Fri from 8 to 4.30 p.m.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Savitri Mulpuri', written in a cursive style.

Savitri Mulpuri  
Primary Examiner  
Art Unit 2812